

INNOVATIONS IN MISSION ARCHITECTURES FOR HUMAN AND ROBOTIC EXPLORATION BEYOND LOW EARTH ORBIT

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Through the application of advanced technologies, mission concepts, and new ideas in combining capabilities, architectures for missions beyond Earth orbit have been dramatically simplified. These concepts enable a stepping stone approach to discovery driven, technology enabled exploration. Numbers and masses of vehicles required are greatly reduced, yet enable the pursuit of a broader range of objectives. The scope of missions addressed range from the assembly and maintenance of arrays of telescopes for emplacement at the Earth-Sun L_2 , to Human missions to asteroids, the moon and Mars. Vehicle designs are developed for proof of concept, to validate mission approaches and understand the value of new technologies. The stepping stone approach employs an incremental buildup of capabilities; allowing for decision points on exploration objectives. It enables testing of technologies to achieve greater reliability and understanding of costs for the next steps in exploration.